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THE CLAIMS

Please rewrite the claims as follows:

1. (Previously Presented) A single-camera system for monitoring a movement of a striking instrument that impacts with an object comprising:

(a) a single camera unit having a light sensitive panel that is capable of being focused on a field of view through which the striking instrument passes prior to striking the object, wherein said single camera unit is capable of shuttering or gating at least two times as the striking instrument and object pass through the field of view;

(b) three or more contrasting areas on the striking instrument and one or more contrasting areas on the object, said contrasting areas positioned so that light emitting therefrom reaches said light sensitive panels to form images thereon and create image signals when camera shutters are open;

(c) an image analyzer capable of discriminating between the striking instrument contrasting areas and the object contrasting areas and determining the conditions of a path and orientation of the striking instrument through the field; and

(d) a rotatable calibration fixture having a pivot point and a plurality of predetermined contrasting areas, wherein three dimensional positions of the plurality of predetermined contrasting areas are known relative to each other, and wherein the striking instrument has a striking face, and wherein the striking instrument is calibrated such that the single-camera system is capable of identifying a position and orientation of the striking face from the striking instrument contrasting areas,

wherein the striking instrument is a golf club comprising a club head and a club face and the object is a golf ball, wherein the image analyzer is capable of determining a club head path and face orientation during a swing of the golf club, and wherein the image analyzer is capable of determining a location of impact of the golf ball on the club face with an accuracy of 0.10 inch.

2. (Previously Presented) The system of claim 1, wherein the striking instrument is calibrated such that a spatial location of the contrasting areas are known relative to a geometric center of the striking face.

3. (Previously Presented) The system of claim 1, wherein the striking instrument is calibrated such that body coordinates of the striking instrument are known relative to the striking instrument contrasting areas.

4. (Previously Presented) The system of claim 1, wherein the striking instrument is calibrated with a priori knowledge of spatial locations of the striking instrument contrasting areas.

5. (Previously Presented) The system of claim 1, wherein the calibration fixture has 10 or more contrasting areas.

6. (Previously Presented) The system of claim 1, further comprising a calibration attachment having a plurality of contrasting areas, wherein the calibration attachment is capable of being disposed on the striking face, and wherein a position of at least one of the plurality of contrasting areas of the calibration attachment is known relative to the striking face when the calibration attachment is disposed on the striking face.

7. (Previously Presented) The system of claim 1, wherein the single camera unit is configured to capture at least one image of the striking instrument when the striking instrument is within about 2 inches or less from the object.

8. (Previously Presented) The system of claim 7, wherein the single camera unit is configured to capture at least one image of the striking instrument when the striking instrument is within about 1 inch or less from the object.

9. (Previously Presented) The system of claim 1, further comprising an electronic light source that emits light in two flashes onto the striking instrument and object.

10. (Previously Presented) The system of claim 1, wherein the striking instrument has four contrasting areas and the object has six contrasting areas.

11. (Canceled)

12. (Previously Presented) The system of claim 1, wherein the golf club is a golf club driver or iron.

13. (Previously Presented) The system of claim 1, wherein the golf club is a putter.

14. - 17. (Canceled)

18. (Previously Presented) The system of claim 1, wherein the image analyzer is capable of determining one or more of a droop angle, a loft angle, a face angle, a path angle, or an attack angle of the golf club.

19. (Previously Presented) The system of claim 18, wherein the accuracy of the image analyzer for determining the golf club droop angle, loft angle, face angle, path angle, or attack angle is within 3 degrees.

20. (Previously Presented) The system of claim 19, wherein the accuracy of the image analyzer for determining the golf club droop angle, loft angle, face angle, path angle, or attack angle is within 1 degree.

21. (Previously Presented) The system of claim 18, wherein the accuracy of the image analyzer for determining the golf club droop angle, loft angle, face angle, path angle, or attack angle is comparable to the accuracy of a 2-camera system.

22. (Previously Presented) The system of claim 1, wherein the image analyzer is capable of determining a club head velocity with an accuracy within 20 feet per second.

23. (Previously Presented) The system of claim 22, wherein the accuracy of the image analyzer for determining the club head velocity is comparable to the accuracy of a 2-camera system.

24. (Previously Presented) The system of claim 1, wherein the single camera unit is capable of shuttering or gating at least three times as the striking instrument and object pass through the field of view.

25. (Previously Presented) The system of claim 1, further comprising a triggering unit for determining when the single camera unit captures an image of the striking instrument and object.

26. (Previously Presented) The system of claim 25, wherein the triggering unit comprises a light source, a reflector, and an optical sensor.

27. (Previously Presented) The system of claim 25, wherein the triggering unit comprises an ultrasonic emitter and receiver.

28. (Currently Amended) A method of monitoring a movement of a striking instrument that impacts with an object comprising the steps of:

(a) providing a single camera unit having a light sensitive panel that is capable of being focused on a first field of view;

(b) providing a calibration fixture having a pivot point and a first plurality of contrasting areas, wherein three-dimensional positions of the first plurality of contrasting areas are known relative to each other;

(c) placing the striking instrument in the calibration fixture at a first orientation within the first field of view, wherein the striking instrument comprises a second plurality of contrasting areas;

(d) capturing a first calibration image of a first perspective view of the calibration fixture and first plurality of contrasting areas and the striking instrument and second plurality of contrasting areas;

(e) rotating the calibration fixture to a second orientation by the pivot point to provide a second perspective view of the calibration fixture and first plurality of contrasting areas and the striking instrument and second plurality of contrasting areas;

(f) capturing a second calibration image of the second perspective view of the calibration fixture and first plurality of contrasting areas and the striking instrument and second plurality of contrasting areas;

(g) analyzing the first plurality and second plurality of contrasting areas in the first and second calibration images to create a three-dimensional global coordinate system;

(h) placing the striking instrument within the first field of view of the single camera unit to provide a first perspective view of the striking instrument and second plurality of contrasting areas;

(i) capturing a first image of the first perspective view of the striking instrument and second plurality of contrasting areas;

(j) providing a second perspective view of the striking instrument and second plurality of contrasting areas;

(k) capturing a second image of the second perspective view of the striking instrument and second plurality of contrasting areas;

(l) analyzing the second plurality of contrasting areas in the first and second images of the striking instrument to determine the three-dimensional positions of the second plurality of contrasting areas; and

(m) determining a location of impact of the object on a face of the striking instrument from the three-dimensional positions of the second plurality of contrasting areas, wherein the location of impact is determined with an accuracy of 0.1 inch.

29. (Previously Presented) The method of claim 28, wherein the first perspective view of the striking instrument and second plurality of contrasting areas differs from the second perspective view of the striking instrument and second plurality of contrasting areas from about 5 to about 10 degrees.

30. (Previously Presented) The method of claim 29, wherein the step of providing a second perspective view of the striking instrument and second plurality of contrasting areas comprises repositioning the striking instrument.

31. (Previously Presented) The method of claim 30, wherein the step of providing a second perspective view of the striking instrument and second plurality of contrasting areas further comprises maintaining the first field of view of the single camera unit.

32. (Previously Presented) The method of claim 28, wherein the first plurality of contrasting areas comprises at least 10 contrasting areas.

33. (Previously Presented) The method of claim 28, wherein a first axis of the three-dimensional global coordinate system is parallel to gravity, a second axis of the global coordinate system is directed toward a target, and a third axis of the global coordinate system is orthogonal to the first and second axes.

34. (Previously Presented) The method of claim 28, wherein the steps of capturing the first image of the first perspective view of the striking instrument comprises capturing the first image prior to impact with the object.

35. (Previously Presented) The method of claim 28, further comprising the steps of:

providing a calibration attachment having a third plurality of contrasting areas, wherein three-dimensional positions of the third plurality of contrasting areas are known relative to each other;

placing the calibration attachment on a striking face of the striking instrument so that the first and second captured calibration images of the first and second perspective views of the striking instrument and second plurality of contrasting areas further comprise images of the third plurality of contrasting areas; and

removing the calibration attachment from the striking face prior to the step of placing the striking instrument within the first field of view of the single camera unit.

36. (Currently Amended) The method of claim 34, wherein the [[the]] step of capturing a second image of the second perspective view of the striking instrument and second plurality of contrasting areas comprises capturing the second image after impact with the object.

37. (Previously Presented) A method of monitoring a movement of a striking instrument that impacts with an object comprising the steps of:

(a) providing a single camera unit having a light sensitive panel that is capable of being focused on a first field of view;

(b) providing a calibration fixture having a pivot point and a first plurality of contrasting areas, wherein three-dimensional positions of the first plurality of contrasting areas are known relative to each other;

(c) placing the striking instrument in the calibration fixture at a first orientation within the first field of view, wherein the striking instrument comprises a second plurality of contrasting areas;

(d) capturing a first calibration image of a first perspective view of the calibration fixture and first plurality of contrasting areas and the striking instrument and second plurality of contrasting areas;

(e) rotating the calibration fixture to a second orientation by the pivot point to provide a second perspective view of the calibration fixture and first plurality of contrasting areas and the striking instrument and second plurality of contrasting areas;

(f) capturing a second calibration image of the second perspective view of the calibration fixture and first plurality of contrasting areas and the striking instrument and second plurality of contrasting areas;

(g) analyzing the first plurality and second plurality of contrasting areas in the first and second calibration images to create a three-dimensional global coordinate system;

(h) placing the striking instrument within the first field of view of the single camera unit to provide a first perspective view of the striking instrument and second plurality of contrasting areas;

(i) capturing a first image of the first perspective view of the striking instrument and second plurality of contrasting areas prior to striking the object;

(j) providing a second perspective view of the striking instrument and second plurality of contrasting areas;

(k) capturing a second image of the second perspective view of the striking instrument and second plurality of contrasting areas after striking the object;

(l) analyzing the second plurality of contrasting areas in the first and second images of the striking instrument to determine the three-dimensional positions of the second plurality of contrasting areas; and

(m) determining a location of impact of the object on a face of the striking instrument and at least one of club velocity, attack angle, path angle, droop angle, loft angle, and face angle from the three-dimensional positions of the second plurality of contrasting areas, wherein the location of impact is determined with an accuracy of 0.1 inch.

38. – 40.

Please add the following new claims:

41. (New) The method of claim 28, wherein the striking instrument comprises a golf club and the object comprises a golf ball.

42. (New) The method of claim 37, wherein the striking instrument comprises a golf club.

43. (New) The method of claim 37, wherein the object is a golf ball.